

equations, subsisting in the triangles of the base net, is between 20 and 21. A number of different kinds of apparatus were employed in the base measures. They all depend on the committee meter as the unit of length. This iron meter is one of the original standards introduced by the French committee in 1879, compared at different times and by different means.

The distance between adjacent base lines varies from 108 miles to 531 miles. This long chain of triangles is characteristic, as compared with similar undertakings, by its strength of composition. The chain consists of quadrilaterals, central figures, or other strong combinations of triangles. The size of the triangles, where they cross the central valley is of necessity of ordinary character; but in crossing the Rocky Mountains their utmost development has been reached. The longest side of a triangle, from Mount Ellen to Uncompaghre, was 182.1 statute miles. The highest trigonometric station was 14,396 feet, and the spherical excess of the adjusted triangle was 73.8 seconds, the triangle having an area of 5,600 square miles. The observation of this gigantic arc was begun 27 years ago, and the last observations which remain to complete the work are now in progress. They will be finished during the present summer, and as the discussion of this vast amount of material is already well advanced, it seems possible that we shall have the results of the completed work ready for publication within the next eighteen months. A preliminary discussion of these results points to certain interesting conclusions relative to the form of the ellipsoid which will best represent this portion of the globe.

The results of the discussion point in the same direction with the preliminary discussion of the arc of the 52nd parallel in Europe, namely, that the curvature is greater than would be required in an oblate spheroid of the dimensions of our earth.

Without, however, attempting to give in detail these preliminary results, I beg to call your attention to the inauguration of the measurement of an arc of the 98th meridian, which has already been begun in the United States, and which, if it could be extended along its whole length throughout Canada and Mexico, would make by far the longest arc of the meridian which has ever been measured, and would, taken in connection with the arc of the parallel, and the arc which I have just mentioned, give data for a most excellent definitive discussion of the spheroid which would best fit the continent of North America. This arc, as is seen from the attached sketch, extends throughout the United States, north and south, and from the southern limit of Canada to the Frozen ocean, and from the southern limit of the United States to the Pacific at Acapulco. The southern end of the arc is in latitude 17 deg., and the northern limit of the arc may very well be extended to 67 deg.,